Branch ligatures and blood aspiration for post-traumatic superficial temporal artery pseudoaneurysm: surgical technique

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CASE REPORT

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Keywords Temporal · Artery · Pseudoaneurysm · Post-traumatic

Introduction

Several options to treat superficial temporal artery (STA) pseudoaneurysm have been reported. Although pseudoaneurysm ligation and excision was the first employed technique [1], more recently endovascular coil embolization [2] and percutaneous ultrasound-guided thrombin injection [3] have been reported. STA pseudoaneurysm morphology and surgeon preference lead to technique selection. In the present case, a new minimally invasive technique to treat a STA pseudoaneurysm in a nonagenarian lady is reported.

Case report

A 92-year-old lady was admitted with a headache and pulsating mass in the left fronto-temporal region. At anamnesis a traumatic head injury, after a fall down stairs, was reported 4 weeks earlier. At medical history hypertension, mitral insufficiency, chronic atrial fibrillation and left atrial appendage thrombus, insulin-dependent diabetes mellitus and advanced chronic renal failure were present. The patient was under oral anticoagulation because of cardiac disease (INR: 2.0). At admission patient presented headache and left periorbital mass. A spiral computed tomography (CT), performed due to skull fracture suspicion, showed no skull lesions; a partially thrombosed pseudoaneurysm originating from frontal terminal branch of STA (35 × 22 mm in diameter) and a nasal bone fracture were detected (Fig. 1).

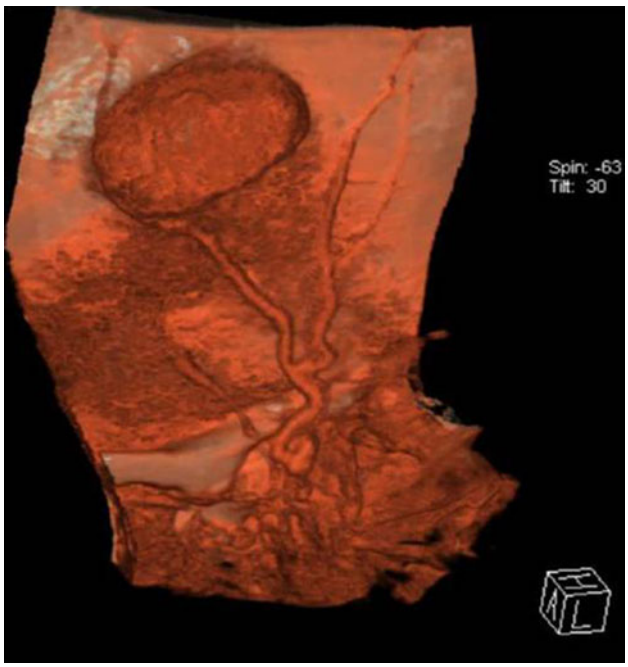

Fig. 1 Preoperative findings. Computed tomography angiography. Superficial temporal artery pseudoaneurysm

Technique

After an unsuccessful 20-min compression on both STA pseudoaneurysm and afferent branch, an operative management was scheduled. Both afferent and efferent branches were identified and marked with ultrasound (US) (Fig. 2a). No other branches were identified both by CT and US preoperatively. Through 1 cm skin incisions both branches were identified, dissected and ligated (Fig. 2b). After ligation, no pulsation was more recognizable. STA pseudoaneurysm decompression was achieved: over a14 G needle was aspirated 15 ml of blood thus reducing considerably pseudoaneurysm size (Fig. 2c). A compressive dressing was left in place for 48 h (Fig. 2d). Recovery was uneventful. The patient was discharged at first postoperative day. During the STA management and at discharge anticoagulant therapy was not modified. Follow-up at 2 weeks and 2 months later showed no signs of recurrence (Fig. 3).

Discussion

In 1861, both a surgical and a conservative approach to "cure aneurysms of the temporal artery" were reported. The first consisted of "opening the tumour, turning out its contents, and tying the artery on each side of it". However, a conservative management by "pressure of the proximal end of the vessel with the finger" was considered as the most indicated approach [1]. STA pseudoaneurysm is rare, with about 200 cases reported mostly as isolated case [4]. STA pseudoaneurysm is suspected in the presence of a preauricular pulsatile mass associated to a history of trauma or surgery into the temporal region. The time from injury to STA pseudoaneurysm development is usually

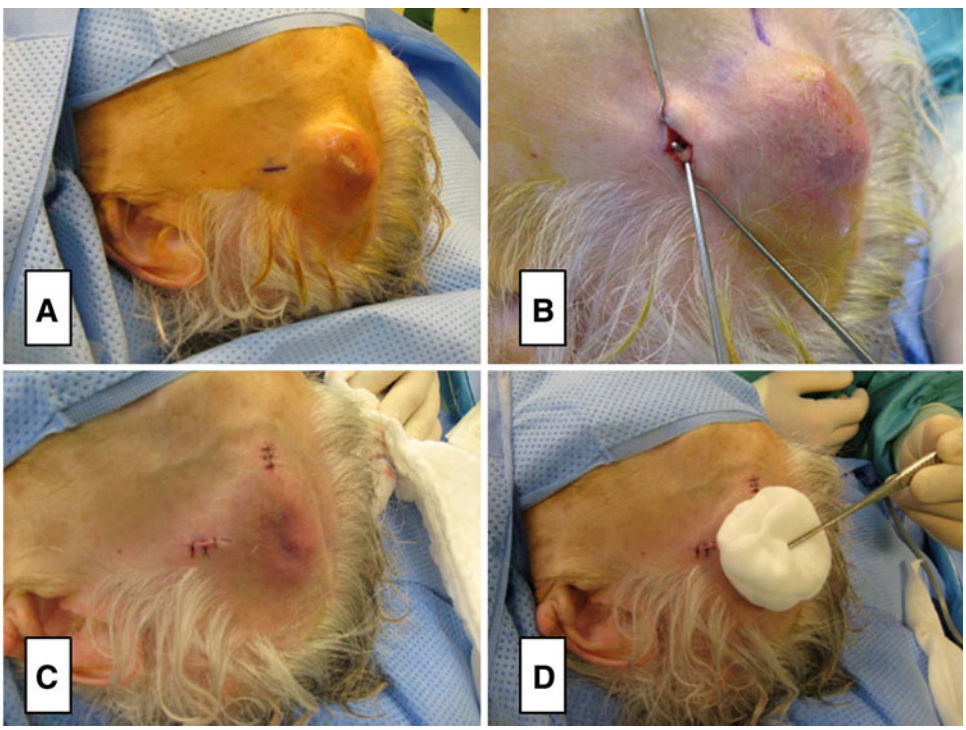

Fig. 2 Intraoperative findings. **a** Afferent and efferent branches ultrasound identification. **b** Afferent branch exposition and dissection through small skin incision. **c** Final result at skin closure and superficial temporal artery pseudoaneurysm percutaneous decompression. **d** Compressive dressing application

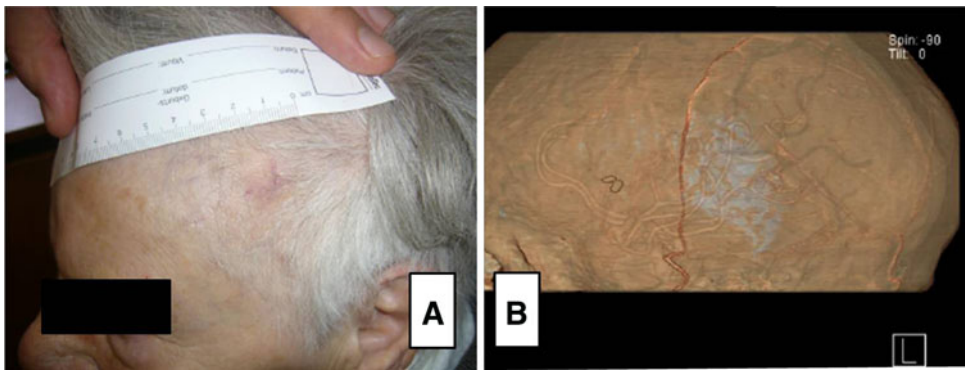

Fig. 3 Two months postoperative findings. **a** Clinical evidence. No aesthetic defect. **b** Computed tomography angiography. No residual pseudoaneurysm, complete occlusion of frontal superficial temporal artery branch and parietal branch patency

2–6 weeks, less than 20 % present between 6 months and 3 years after injury. The clinical diagnosis is supported either by US, CT and angiography. Although STA pseudoaneurysm rupture has been reported, no definitive data upon its natural history are available [5]. A surgical repair is usually indicated when pain, cosmetic deformity, and the potential for rupture is present [6]. The most employed operative technique remains branches ligation and pseudoaneurysm excision under local anaesthesia [6]. A conservative approach can be utilized in critically ill patients [7]. Other operative options, such as transarterial pseudoaneurysm coiling [2, 8] and ultrasound percutaneous embolization [2, 9, 10] can be effective. The reported allergic reaction, systemic thrombosis, distal ischemia, and related-cost represent a limitation to a widespread use of these approaches [2, 11]. In the present case, the attempt to treat the pseudoaneurysm with 20-min compression of afferent branch was not successful. An endovascular approach was excluded due to severe atherosclerosis of aortic arch and external carotid artery, and the chronic renal failure. After branches ligature, the STA pseudoaneurysm surgical excision was replaced by percutaneous sac puncture and blood aspiration, thus achieving a significant mass reduction. It could argued about the concept to leave the pseudoaneurysm sac in place. In our experience, STA pseudoaneurysm evolution into fibrotic tissue did not generate any scar or skin retraction. The limited time of follow-up, however, is not enough to validate this technique.

Conclusion

This surgical approach was safe and effective in STA pseudoaneurysm treatment. Its minimally invasive feature allowed limited exposition with unnecessary anticoagulation therapy modification and good aesthetic result. This technique could be included in armamentarium of STA pseudoaneurysm treatment.

Conflict of interest Zoran Rancic and other co-authors have no conflict of interest.

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